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ABSTRACT

This report provides an overview of Indiana's Twenty-first Century Scholars Program and analyzes a state database to assess the impact of the program on college enrollment and persistence. The Twenty-first Century Scholars Program asks low-income eighth graders to make a commitment to take the necessary steps to prepare for college. In return, the state of Indiana provides support to students and their parents to help these teens prepare for college. The state also ensures that students in the program receive financial aid sufficient to cover tuition in-state tuition at an Indiana university or its equivalent at a private college. Overall, 65,599 students have been fully enrolled in the program since 1995. This study focused on the program's impact on students in the high school graduating class of 1999, about 2,590 students. Findings show that Scholars were more likely than non-Scholars to enroll in Indiana public and private colleges. Scholars and non-Scholars who received financial aid were more likely to persist during the freshman year than those who did not receive aid. Participation in the Scholars Program improved postsecondary opportunity for low-income students, playing a substantial role in college access in the 1990s in Indiana. (Contains 15 tables, 26 endnotes, and 41 references.) (SLD)

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Executive summary

Indiana's Twenty-first Century Scholars Program asks low-income eighth-graders to make a commitment to take the necessary steps to prepare for college. In return, the State of Indiana provides support to students and their parents to help these teens prepare for college. The state also ensures that students in the program receive financial aid sufficient to cover in-state tuition at an Indiana public university or its equivalent at a private college. This report gives an overview of the Scholars Program and analyzes a state database to assess the impact of the program on college enrollment and persistence.

The Twenty-first Century Scholars Program, created through legislation in 1990, provided scholarships to approximately 15,000 students in the high school classes of 1995 through 2000. The Scholars program has two major features:

- **It supplements student aid.** Students pledge to apply for a state grant when they apply for college in Indiana. The state agrees to supplement the state grant through a Scholars award that will raise the total award to the level of tuition at an Indiana public college.
- **It provides support services.** Sixteen regional service centers provide a comprehensive set of services to parents and students, including workshops, mentoring and campus visits.

The college-continuation rate (the percentage of high school graduates who go on to college) increased substantially in Indiana in the 1990s. In 1986, Indiana ranked 40th among states in college continuation; by 1998, it had improved to 17th. Three main factors have been cited to explain this improvement:

The Scholars Program supplements student aid and provides support services to parents and students.

- Changes in high school curriculum.
- Support services provided to high school and middle school students through, among others, the Indiana Career and Postsecondary Advancement Center.
- The Twenty-first Century Scholars Program.

This study examines the effects of the Twenty-first Century Scholars Program on college enrollment and persistence. Specifically, it focuses on the program's impact on students in the high school graduating class of 1999. Key findings include:

- Scholars were more likely than non-Scholars to enroll in Indiana public and private colleges.
- Scholars and non-Scholars who received financial aid were more likely to persist during the freshman year than those who did not receive aid.

Participation in the Scholars Program improved postsecondary opportunity for low-income students. This study confirms that the program played a role in the substantial gain in college access in the 1990s in Indiana. Thus Indiana's Twenty-first Century Scholars Program represents a promising approach to addressing inequalities in educational opportunity.

Introduction

The process of expanding access to higher education, a challenge facing many states, is a complicated proposition. It requires coordination of financing strategies (Hearn and Anderson, 1995; Hearn and Longanecker, 1985) and the improvement of elementary and secondary schools (Finn, 2001). Although need-based grants were widely used as a means of ensuring financial access through the 1970s, federal student aid is no longer adequate to that task (Advisory Committee on Student Financial Assistance, 2002; St. John, 2002, in press). In recent years, some states have developed merit grant programs that provide scholarships to students who meet predefined standards of academic preparation (Heller and Rasmussen, 2002). Although federal need-based grant aid still plays an important role in access for low-income students, current evidence suggests that merit-based grant programs do not adequately serve this population.

While college participation rates have increased during the past two decades, a new disparity in college opportunity has evolved since 1980 (Kane, 2001; St. John, in press). Simply put, low-income students are attending at an increasingly lower rate than are upper-income students. Although family income plays a significant role in education at every level, some analysts say that improving academic preparation is the key to greater educational opportunity (NCES, 1996, 1997, 2000). Other analysts emphasize that the decline in federal student financial aid explains the widening "access gap" between low- and upper-income students (Advisory Committee on Student Financial Assistance, 2001). Recent research that considers both academic and financial explanations for unequal college access shows that more than 22 percent of low-income, academically qualified students do not attend, possibly because they cannot afford college, even with student aid (St. John, 2002). The push for higher educational standards and greater accountability among public schools may help explain the increased college-enrollment rate after 1980. Still, the decline in federal grant aid appears to be the best explanation for the growing gap in college-participation rates across ethnic and income groups (St. John, 2002, in press).

The decline in federal grant aid appears to be the best explanation for the growing gap in college-participation rates.

Postsecondary encouragement efforts — programs that provide information to middle

school and high school students about the steps they should take to prepare for college — can increase access for students who are able and willing to borrow enough to attend. If such programs are linked to adequate grant aid, they are naturally more effective in improving financial access for academically prepared low-income students. A new federal program — Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) — funds organizations that provide encouragement to students to attend college, but it does not provide funding for student grant aid. The federal TRIO programs, educational opportunity outreach efforts which include Upward Bound and Talent Search at the pre-collegiate level, represent the largest federal intervention programs; they help even more students find successful pathways to college. If states complement these initiatives with adequate grant aid, then these or other federal intervention programs can enable states to expand access and narrow the opportunity gap for students who prepare academically for college. In other words, it is generally ineffective to address *only* academic preparation *or* financial aid. To truly improve postsecondary opportunity, officials must follow financial aid policies that ensure financial access for qualified students, *and* they must encourage students in middle and high school to take the steps necessary to prepare for college.

It is generally ineffective to address only academic preparation or financial aid.

Since 1986, Indiana has developed two programs that provide postsecondary encouragement. The Indiana Career and Postsecondary Advancement Center (ICPAC) supplies information to high school students across Indiana, encouraging all students to take the steps necessary to prepare for college. In addition, ICPAC provides information about careers and student aid for all middle school and high school students. The Twenty-first Century Scholars Program ensures adequate grant aid and support services to low-income students who take a pledge to prepare for college. The State Student Assistance Commission of Indiana (SSACI) received a five-year, $25 million federal GEAR UP grant to expand the information, support and referral services provided by regional service centers for the Scholars Program.

This report describes Indiana's Twenty-first Century Scholars Program and summarizes statistical analyses that assess the program's impact. First, the overview of the program documents the extent and range of services it provides. Next, summaries of statistical analyses demonstrate the program's impact on college enrollment and persistence. The data for these statistical analyses came from ICPAC's annual survey of ninth-grade students and from individual records provided by the Indiana Commission for Higher Education (CHE) and the State Student Assistance Commission of Indiana (SSACI). More detailed information about the data sources is provided in Appendix 2 on Page 30.

Twenty-first Century Scholars Program

Indiana's Twenty-first Century Scholars Program emerged in 1990 as an initiative of Gov. Evan Bayh. (See article on the program's history, Page 6.) The program essentially establishes a contract between middle school students, who promise to take the steps necessary to prepare for college, and the state, which promises to provide scholarships sufficient to cover in-state tuition at an Indiana public college or university or its equivalent at a private college. The scholarships were funded when the first class of students entered college, enabling the Twenty-first Century Scholars Program to become a model program nationally.

Indiana's Twenty-first Century Scholars Program has three main components:

- It fills participants' remaining financial need after state and federal grant aid has been applied, based on full tuition at Indiana public colleges and universities.
- It provides comprehensive support services to participants in middle and high school through regional centers that enable students to make informed educational choices.
- It provides a promise from the State of Indiana to middle school students who graduate with at least a 2.0 grade point average and meet the program's behavioral requirements. The state guarantees tuition to those students who fulfill their part of the bargain and gain admission to an Indiana institution.

Features of the program

The Twenty-first Century Scholars Program asks low-income eighth-graders to pledge to take the steps necessary to prepare for college.[1] The principal eligibility criterion for the program is that a student must qualify for the federal Free and Reduced Lunch program, the primary indicator of poverty in K-12 education. Students pledge to:

- Graduate from an Indiana high school.
- Maintain at least a 2.0 grade point average.
- Apply for admission to an Indiana college.
- Apply for financial aid.
- Refrain from using illegal drugs and alcohol.
- Refrain from committing a crime.
- Enroll full-time at an eligible Indiana college or university within two years of high school graduation.

The history of the Scholars Program

In 1990, Indiana Gov. Evan Bayh introduced the idea for the Twenty-first Century Scholars Program in his State of the State address. The idea was inspired by the success of Eugene Lang's I Have a Dream Foundation with students in a low-income New York City school. Indiana Rep. Stan Jones authored the legislation and was a guiding force, and both houses of the General Assembly embraced it.*

Legislators differed over how to define realistic expectations for students who have not traditionally considered college. Points of debate included the grade point minimum, how to verify adherence to the alcohol and drug standard, and the expected cost of the program. Some feared all students would enroll and estimated the annual cost at $15 million, but the authors knew that full participation was unlikely among students who have not traditionally attended college. Efforts to keep the program simple succeeded.

Initially the program was an unfunded mandate, and several state agencies collaborated to begin enrolling students and to build a database of Scholars. With initial funds from the budget office, the first photocopied applications were mailed to schools.

In 1991, a grant from Lilly Endowment began funding the component of the program designed to serve parents. In the 1992 budget biennium, the legislature provided funds to pay the director of the student enrollment and support component. Although the parent and student components collaborated closely from the beginning, in 1994 they were merged into one office and were housed at the State Student Assistance Commission of Indiana.

Initially school counselors and other personnel were skeptical about the program. Because funds for the scholarships were not set aside or included in the state budget at the outset of the program, some questioned whether the legislature would come through with the money when the time came; therefore, initial enrollment in the program was low. (This concern was not unfounded; New York's Liberty Scholars Program, for example, was one in which such funds never materialized.) In 1995, when the first Scholars were in their senior year of high school, several students and university personnel spoke before the Ways and Means Committee in support of the program, and the legislature appropriated funds for the scholarships. Enrollment of eighth-graders grew quickly in subsequent years. The first budgeted amount for scholarships was $2.5 million.

From its beginning, one goal of the Scholars Program was to empower parents to support their children. Initially parents were organized into support groups, and workshops were offered to address parents' expressed needs. Workshops included: how to participate in a parent-teacher conference, how to set up a study environment in the home, etc. Also, the regional staff established relationships with existing local agencies to develop a support network for families.

Stan Jones, Indiana Commissioner for Higher Education, emphasized that it is not just about the money (i.e., financial aid). It is also about raising aspirations, acclimating students to the concept of going to college, and helping them prepare.

* The current Indiana Code for the Scholars Program is Title 20 12 70, which includes later refinements to the initial public law.

The state also makes a pledge to students as part of the contract formed in this program. The state's pledge is to:

- Pay in full the tuition and fees at any public college in Indiana, or contribute a like portion of tuition at an independent college.[2]
- Provide support services for Scholars, including tutoring, mentoring, college visits and activities for parents.
- Disseminate additional information about higher education and encourage Scholars to pursue a college-preparatory curriculum.

The program encourages postsecondary access to low-income students in several ways. First, the state's pledge to provide grants equaling tuition at public colleges reduces the financial barrier to postsecondary education, especially since these grants are awarded in addition to federal need-based grants. Federal grants continue to play an important role in Indiana, but the awards under the state's student grant programs are independent of federal awards. Studies of the impact of grant aid in the state indicate that state grants were sufficient to improve opportunity to persist across income groups in Indiana (St. John, Hu and Weber, 2000, 2001; St. John, Musoba and Simmons, 2001). The financial guarantee provided by the state as part of the agreement with Twenty-first Century Scholars may be a principal reason for the program's impact, but it is also necessary to assess the impact of other program features on access.

Second, the pledge to offer support services goes substantially beyond providing direct services that help students apply for college. Regional service centers provide tutoring, mentoring, campus visits and other opportunities. An assessment of the impact of the program should consider the extent of services provided.

Third, the state pledges to encourage students to pursue a college-preparatory curriculum. Prior research on Indiana high schools revealed that many students lacked access to college-preparatory courses (Paul, 1997; Rosenbaum, Miller and Krei, 1997). In Indiana, substantial changes in high school curricula have made the college-preparatory track more generally available.[3]

Program scholarship participation

The Twenty-first Century Scholars Program has awarded scholarships to more than 14,494 students[4] during the six years since the first cohort of eligible students finished high school. More students enrolled in eighth grade, but did not affirm their Scholar status in the twelfth. The total number of scholarship recipients is uncertain because there is no record of the number of students in the 1995 cohort who did not enroll in college in state. The number of students with scholarships ranged from 2,327 in the 1997 cohort to 3,248 in the 2000 cohort. About 75 percent of the students who applied for aid in the twelfth grade (and thereby activated their scholarships between 1996 and 2000) actually enrolled in Indiana two- and four-year colleges and universities. (Only 3,227 of the 13,070 students in those cohorts did not enroll.) An additional group (about 6 percent) enrolled out of state.[5] But these are not typical students; they are students who take a pledge in eighth grade to prepare for college, induced perhaps by financial promises, but also supported by a high level of service provided on a statewide basis. Overall, 65,599 students were fully enrolled in the program since 1995, with 24,889 affirming their pledge through the 2002-2003 academic year. Besides scholarships, the program involves an extensive series of early-intervention strategies.

Overall, 65,599 students were fully enrolled in the program since 1995.

The Scholars Program legislation led to enrollment of the first cohort of students in 1990. In 1991, through a grant from Lilly Endowment, the program added a Parents Project in urban sites around the state. In 1992, with state support (funding through the Commission for Higher Education, the State Budget Agency and the State Student Assistance Commission), the Indiana Career and Postsecondary Advancement Center was engaged to manage the program's enrollment, database and mailings.

With the 1992-94 budget, the state expanded the number of support centers to nine. Then in 1994, an AmeriCorps grant provided 22 volunteers, and this increased services provided by regional centers. In 1999, 16 sites were funded through the state's GEAR UP grant, providing support services for all urban and rural areas of the state. The GEAR UP funds almost doubled the availability of services offered through the program. Currently each regional center has between six and 12 staff (volunteer or paid), along with AmeriCorps members, who facilitate the center programming, tutoring, mentoring and other services. Before 1999, AmeriCorps members provided the direct student services such as one-on-one mentoring, but since the GEAR UP grant and subsequent growth, they have a more indirect role, generally recruiting and training mentors and tutors. Since 1999, the minimum goals for services provided by each site include:

- Three campus visits per student by the junior year.
- One campus visit with parents.
- An increase in parent participation of 5 percent each year.
- An increase in the number of colleges participating in campus visits.
- Three collaborative efforts with local community organizations.
- One collaboration with a postsecondary institution and one with a local business.

Currently, each site has a full-time coordinator, parent representative/coordinator, parent support group, AmeriCorps service members (six to 12 per site), and an Indiana workforce-development component. In addition, a Web-based tracking system was implemented in May 2001. In 2001, the regional centers made extensive use of this information-tracking system.[6]

Table 1
Number of students served# through the Twenty-first Century Scholars Program

Cohort*	Years each student has drawn a Twenty-first Century Scholarship						
	0	1	2	3	4	5	Total
1995	N/A	402	331	208	438	45	1,424
1996	597	669	435	330	486	45	2,562
1997	501	595	424	314	493		2,327
1998	506	646	557	629	5		2,343
1999	604	907	1,077	2			2,590
2000	1,019	2,187	37	5			3,248
TOTAL	3,227	5,406	2,861	1,488	1,422	90	14,494

More students enrolled in eighth grade but did not pursue their scholarships in twelfth.
* Year students graduated from high school.
N/A: Data not available from 1995 for students who did not enroll in higher education.
Source: State Student Assistance Commission of Indiana.

Table 2
Average financial aid package at public colleges for Indiana Twenty-first Century Scholars and non-Scholar aid recipients between 1990 and 2000

	1990-1991	1996-1997	1997-1998	1998-1999	1999-2000
Grants N/A					
Twenty-first Century Scholars	N/A	$3,060	$3,442	$3,667	$3,667
Other aid recipients	$1,643	$1,832	$1,855	$2,122	$2,188
Loans					
Twenty-first Century Scholars	N/A	$1,528	$1,490	$1,614	$1,253
Other aid recipients	$963	$3,178	$2,865	$2,871	$2,452
Work-study					
Twenty-first Century Scholars	N/A	$107	$250	$176	$140
Other aid recipients	$71	$71	$70	$69	$64
Twenty-first Century Scholarship	N/A	$1,354	$1,222	$1,330	$1,458

Source: Student Information System data from the Indiana Commission for Higher Education. N/A: Grants for the Twenty-first Century Scholars Program were not issued until 1995.

The Scholars Program supplements student aid

The Scholars Program provides supplemental grants to low-income students who enroll in college — a substantial sum in addition to the normal state grant. An analysis of trends in aid packages[7] (Table 2, above) indicates that Scholars in public colleges received grants that averaged about $1,400 more than the grants of aid recipients who were not Scholars. The average supplemental award through the Twenty-first Century Scholars Program ranged from $1,222 in 1997-98 to $1,458 in 1999-2000.

Twenty-first Century Scholars took on substantially lower debt levels than did other aid recipients, at least in public colleges. On average, Scholars borrowed about $1,200 less than other aid recipients. Prior research shows that low-income and minority students typically borrow more than do middle-income students (Paulsen and St. John, 2002) and are less likely to enroll or persist if debt levels are too high (Kaltenbaugh, St. John and Starkey, 1999; St. John, 1991). The Twenty-first Century Scholars Program enables students to minimize debt, which may improve the ability of these students to complete college.

The Twenty-first Century Scholars Program enables students to minimize debt.

Scholars receive slightly larger work-study awards from their colleges than the average for other aid recipients. This pattern is consistent with a general institutional practice that reserves work-study funds for students with substantial financial need (Paulsen and St. John, 2002). Therefore, variation in work-study awards probably is unrelated to the Scholars Program.

The financial aid packages for freshmen in public colleges in 1999 are presented in Table 3 below. Students in the Scholars Program received higher need-based grants from the state and the federal government than did other student aid recipients. Scholars received need-based state grants that averaged $1,645, compared to average awards of $639 for other students receiving student aid. In addition, Scholars received average awards of $1,457 for the Scholars share of their state grant. The total state grant (Scholars award plus need-based grant) averaged $3,103. Because these students received other need-based grant aid, they received $1,850 in grants, on average, that could be used for living costs (food, lodging and textbooks).

The Twenty-first Century Scholars Program awarded about $4.8 million in 1997-98 and about $8.1 million in 2001-02 (see Table 4, Page 11). These scholarship awards were in addition to the state's need-based higher education awards. The average award in 1999-2000 was comparable for all students ($1,497) and the public college students in our sample ($1,457). In addition to the scholarships, the state spent about $500,000 on administration at the state level and about $1.8 million on early-intervention programs in regional offices in 2001-02 (Table 5, Page 11).

Support services

The Twenty-first Century Scholars Program provides an extensive array of services to students and parents. Table 6 on Page 12 summarizes a survey of the 16 regional service centers, with 13 centers responding. On average, each of the 13 centers provided mailings to 2,433 students

Table 3
Aid amounts for Twenty-first Century Scholars and other aid recipients in public colleges for the 1999 school year

Types of aid	Mean for all students	Mean for Twenty-first Century Scholars	Mean for other aid recipients
Total Grants	$1,142	$3,667	$2,188
Loans	1,183	1,252	2,452
Work-Study	35	140	64
Federal Grants	394	1,583	732
State Grants	353	1,645	639
Twenty-first Century Scholarship	50	1,457	0
Total State Grant Aid including Twenty-first Century Scholars	403	3,103	639
Other Grants	395	438	817
Tuition	3,307	3,274	3,303
Net Tuition (Tuition – Grants)	2,115	-(1,850)	1,115
Number of Students	**25,823**	**881**	**12,007**

(31,627 total) and conducted 2,602 workshop sessions with students (33,823 total). Hundreds of students also participated in campus visits (2,881 reported), tutoring (2,424) and other events. Given the smaller number of enrolled Scholars (compare to Table 1, Page 8), it appears that most Scholars had multiple contacts with the regional support centers.

Thousands of parents were also involved in workshops and support programs. Parent services are designed to enable parents to take an active role in their children's educational choices and academic preparation. In an effort to empower and inform parents rather than replace them in the college choice process, regional centers offer financial aid workshops, campus tours, parent support groups and other services. These centers provide a comprehensive set of services designed to enable students to prepare for college.

ICPAC also provides information and an extensive set of support services, (Gillie, 2001; Hossler and Schmit, 1995), including:

Table 4
Twenty-first Century Scholarships used by students in public and private colleges (data for 2001-2002 are estimated)

	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002
Students	3,537	4,382	4,600	5,029	5,773
Mean	$1,347	$1,449	$1,497	$1,507	$1,399
Median	$1,114	$1,218	$1,229	$1,194	$1,031
Total	$4,765,080	$6,349,763	$6,884,035	$7,579,567	$8,074,640

NOTE: The figures include only the additional Twenty-first Century Scholars scholarship and not other need-based financial aid. The number of Scholars with scholarships can be lower than the total number of Scholars for a variety of reasons:

1) Some Scholars choose to attend college part-time and are therefore not eligible for the scholarship; 2) Full-need honors students might have all their tuition paid from the state Higher Education Award grant and therefore have no scholarship; 3) The scholarship can be applied only after other state and institutional aid has been used, hence there might be no scholarship.

Source: State Student Assistance Commission of Indiana

Table 5
Twenty-first Century Scholars Program early-intervention program and administration costs (data for 2001-2002 are estimated)

	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002
Administration	$411,202	$467,910	$411,202	$467,910	$494,184
Program	$1,855,148	$1,739,534	$1,855,148	$1,739,534	$1,845,672

NOTE: Costs are state costs only. Program costs are for the early-intervention programs at the 16 sites. Administration costs are local to the Twenty-first Century Scholars office at SSACI.

Source: State Student Assistance Commission of Indiana

Table 6
Types of services offered and number of people served by the Scholars Program regional centers in 2000-2001

Service	Total number served at 13 centers**	Average number served per center
Workshops for students: Career, drug prevention, financial aid or SAT preparation	33,823	2,602
Mentoring: Ongoing one-on-one, group or professional relationship	9,795	753
Tutoring or academic support: Math, English, other subjects, or college entrance exams (more ongoing or hands-on than a one-time session)	2,424	186
Social/cultural events: Scholar pledge ceremony, cultural events, holiday celebrations and social/recreational events	7,832	602
Career counseling/services: Academic advising, job site visits or college student shadowing	6,469	498
Campus visits/tours	2,881	222
Summer academic day/overnight camps	1,060	81
Service learning volunteer activities	1,166	90
Mailings for students	31,627	2,433
Total number of services Provided to students	97,333	7,487
Workshops for parents: Financial aid, college prep, career choices, Core 40/academic honors, ISTEP/SAT/ACT information, study skills	3,647	280
Ongoing parent support: Conferences, support groups and financial aid guidance	3,266	251
Total number of services provided to parents	6,913	532

Source: Survey of regional coordinators Winter 2001-02.

**Thirteen of sixteen regional centers responded to the survey.

- Guidance for making the most of the high school experience in preparing for college and career, including information about high school curriculum options.
- Information about colleges and the higher education experience, including a searchable database of college profiles.
- Advice on how to succeed in college.
- A free hotline to all Indiana residents for information requests, with follow-up mailings.
- Regular mailings regarding higher education, financial aid, career exploration, etc., for students and their parents.
- A Web site listing alternative sources of information for students and parents
- An online resource store for the purchase of information.
- Publications in Spanish and English.

This combination — general support for all residents plus targeted services for Scholars provided by regional service centers — represents a comprehensive support system. It supplies information about what it takes academically to prepare for college and offers support to students who can benefit from encouragement.

Academic preparation

Research conducted in the early 1990s on the transition to college revealed two problems with the academic pipeline in Indiana. First, students lacked sufficient information about local employment opportunities, and few high schools offered courses that prepared students for local employers seeking high school graduates (Orfield, 1997). Second, many high schools lacked a sufficient college-preparatory curriculum (Paul, 1997). Studies that followed high school students through college in the 1990s found that the quality of information provided to families had improved, but there were major income-related differences in academic preparation and college enrollment: Low-income families were less likely to send their children to college in Indiana (Hossler, Schmit and Vesper, 1999).

The State of Indiana has encouraged high schools to offer college-preparatory programs and has offered incentives to students and school corporations[8] to increase participation in these programs. In 1994-95, the Indiana Department of Education developed the Core 40 curriculum outlining the hours of science and math required for admission to a four-year college (Indiana Education Policy Center, 1994). The prior year the Indiana Department of Education started the Honors diploma, which required an additional year of math, science and language. Schools were given additional incentive funding for Honors graduates. In addition, the state's student grant programs were modified to provide slightly higher need-based awards to students with Honors and Core 40 diplomas in 1998 (St. John, Hu and Weber, 2001). Students receiving Higher Education Award grants with Honors diplomas received the maximum need-based award amount, Core 40 graduates received 90 percent of the maximum, and students with regular diplomas received 80 percent.[9] To help increase participation in college-preparatory courses, ICPAC included information on these incentives with the material provided to all high school students.

By 1999, nearly half of the students graduating from Indiana's high schools had either a Core 40 or Honors diploma (Table 7, Page 14). Schools in large cities and rural areas outside metropolitan statistical areas (MSAs) had the lowest percentages of students completing these programs (44.8 percent and 43.9 percent, respectively). In contrast, slightly more than half of the graduates from high schools in the urban fringe or rural locales inside of MSAs graduated with Core 40 or Honors diplomas. The greatest disparity was in Honors diplomas: Only 15 percent of the graduates from large urban school corporations had this qualification, while an average of 25.6 percent of the graduates from schools in large towns had this diploma (Table 7). Nevertheless, a

substantial percentage of the graduates from all types of high schools were graduating with adequate course work to enroll in college.

Financial aid award as an incentive for students

While the primary state grant programs based award amounts, in part, on the type of high school diploma a student earned, Twenty-first Century Scholars received awards higher than the maximum need-based award (topping off the normal state grant). The maximum need-based award was indexed to tuition the year prior to the current year, while Twenty-first Century Scholars received awards indexed to the current tuition. In addition to receiving a need-based state grant, Scholars received a scholarship that "topped off" their state award.

Table 7
Percent of high school graduates with Core 40 diplomas by high school locale in 1999

Locale	Mean percent with Core 40 including Honors diplomas	Mean percent with Core 40 excluding Honors	Mean percent with Honors diploma
Large city	44.79%	29.79%	15.00%
Mid-size city	45.94	24.91	21.03
Urban fringe of large city	50.89	29.86	21.04
Urban fringe of mid-size city	50.13	27.78	22.35
Large town	46.40	20.80	25.60
Small town	46.46	24.86	21.61
Rural outside MSA*	43.94	24.30	19.65
Rural inside MSA	50.03	28.68	21.35
Total	47.39	26.64	20.75

*Area with a population less than 2,500 that is not in any metropolitan statistical area.

Source: Indiana Department of Education, online at IDEANET

Program impact

We used a four-step process to evaluate whether the Twenty-first Century Scholars Program has an impact on access beyond the base provided by the high school curriculum and the generally available state grant program. First, we reviewed trends in indicators related to access that could be influenced by changes in high school curriculum or the Twenty-first Century Scholars Program (Appendix 1, Page 24). Second, we built a database using a statewide survey of ninth-grade students, state records on Twenty-first Century Scholars and student aid, and state data on college students (Appendix 2, Page 30). Third, we developed a statistical model to assess the impact of the Scholars Program on college enrollment (Appendix 3, Page 32). Finally, we developed a statistical model to assess the impact of aid packages on within-year persistence during the first year of college for students who enrolled in public colleges (Appendix 4, Page 38). The results of these analyses are summarized below.

Trends in statewide outcomes

Trends in key indicators provide prima facie evidence of the effects of school reform postsecondary encouragement and student aid. We examined trends in key indicators related to student achievement for Indiana high school students and to educational progress (Appendix 1), as a means of situating the statistical studies of the Scholars Program's impact.

Reforming schools is one of the necessary steps states must take to improve access to postsecondary education (Finn, 1990, 2001; NCES, 1997, 2000). Since Indiana has taken steps to improve high schools' curricula, we needed to consider whether these policies improved student achievement. The trends in Advanced Placement (AP) examination results revealed little change in the percentage of students passing these examinations over time, but students in rural areas were less likely to take and pass the exams (Table 1.1, Page 25). In addition, trends in the percentages of students taking the SAT and in the average SAT scores (Table 1.2, Page 27) revealed that:

- Higher percentages of Indiana students took the SAT each year than did students in the nation as a whole.
- The percentage of students taking the SAT increased in Indiana at about the same rate as it did nationally between 1988 and 2001.
- The average SAT score in Indiana was slightly lower than the national average,

but this may have occurred because a higher percentage of Indiana students took the exam.

Thus there were modest achievement gains that may be attributable to changes in curriculum during the 1990s. However, improvements in academic preparation can also influence high school graduation rates and college-continuation rates for graduates.

High school graduation rates fell nationally during the last decade, and Indiana was no exception (Table 1.3, Page 28). Between 1988 and 1998, high school graduation rates in Indiana fell from 78 percent to 71 percent. These trends should raise concerns about the impact of school reform, but they are largely unrelated to the impact of ICPAC or the Twenty-first Century Scholars Program.[10]

The continuation rate in Indiana rose from 37.5 percent in 1986 to 60.5 percent in 1998.

When trends in college-continuation rates for high school graduates were examined (Table 1.4, Page 28), it was apparent that Indiana had improved substantially — even more than the nation as a whole. The continuation rate in Indiana rose from 37.5 percent in 1986 to 60.5 percent in 1998. During the same period, the national rate increased from 43.1 percent to 57.2 percent. Indiana's improvement boosted the state from 40th among states in 1986 to 17th in 1998. There is good reason to expect that improvements in K-12 curriculum influenced the rate of improvement nationally and in Indiana. However, the fact that Indiana improved at a rate substantially faster than the national average could be attributable, at least in part, to the high quality of postsecondary encouragement, the level of state grants in general, and the support of low-income students through the Twenty-first Century Scholars Program.

These trends help situate the analyses of the impact of the Twenty-first Century Scholars Program. Changes in postsecondary encouragement can influence more students to take college-preparatory curricula (e.g., Core 40 or Honors), as well as influence more students to apply for financial assistance. Indiana has provided sufficient student grant aid to increase low-income students' chances to persist (St. John, Hu and Weber, 2000, 2001) and has also improved preparatory courses, as noted above. Without these foundations, the promise provided by the Twenty-first Century Scholars Program could be false, leaving many low-income students with unfulfilled college dreams.

Does the Twenty-first Century Scholars Program improve the chances for low-income students to attend college? The pledge process encourages students to take advantage of the college-preparatory courses and to secure additional support services. It also guarantees financial support for college. If statistical modeling can demonstrate that Scholars are more likely to attend college than non-Scholars (controlling for factors known to affect postsecondary enrollment), then there is compelling evidence that the program improves opportunity above and beyond the base level provided by the improved high school curriculum.

Impact of the Scholars Program on access

A multinomial logistic regression model was used to determine the effects of eighth-grade enrollment as a Twenty-first Century Scholar on postsecondary enrollment. The model controlled for individual and contextual effects known to affect college access.[11] For example, student background (gender, ethnicity, family characteristics), middle school grades, postsecondary aspirations, participation in the Twenty-first Century Scholars Program, and high school characteristics (percent Honors graduates, percent minority, percent poverty, and locale) were

included in the model (Appendix 3, Page 32). Using data for the cohort who should have graduated from high school in 1999, the model compared students with no evidence of college enrollment to those who enrolled in an Indiana public two- or four-year institution or who had a high probability of enrolling out of state or at an Indiana private college or university.[12] The *reference* group was composed of students who did not attend a public college in Indiana, did not receive a state grant to attend a private college in Indiana, and did not send an application for aid to an in-state private college or any out-of-state college. Overall, as shown in Table 8, 64 percent of Scholars in the merged database[13] enrolled in Indiana public colleges and universities, and 15 percent of Scholars enrolled in Indiana private colleges. Although 15 percent of Scholars did not enroll in any postsecondary institution, this compares favorably with the 44 percent of non-Scholars who did not enroll in college.

The model provided the following discrete comparisons, estimating the impact of these variables in four related categories:

- *Enrollment in public four-year colleges:* Students who enrolled in public four-year colleges were compared to the reference group.
- *Enrollment in public two-year colleges:* Students who attended public two-year colleges were compared to the reference group.
- *Probable[14] enrollment in in-state private colleges:* Students who received state grants (Scholars and others) and who enrolled in a private college in state along with other students who requested that their financial aid application information be sent to these colleges (and did not attend public colleges) were compared to the reference group.
- *Probable[15] enrollment out of state:* Students who applied for aid and sent information to colleges out of state (and who did not enroll in state) were compared to the reference group.

The summary below reports on the impact of full participation in the Scholars Program, which includes applying for financial aid.

Table 8
Postsecondary enrollment decisions in 1999 by Twenty-first Century Scholar status for students in the study sample

	Twenty-first Century Scholar	Non-Scholar
Enrolled in public four-year	48.37%	34.70%
Enrolled in public two-year	15.71	7.11
Probable enrollment in Indiana private college	15.49	8.11
Probable enrollment out of state	5.18	5.81
No enrollment evidence	15.26	44.26
Total	100.00	100.00

Source: Merged database (see Appendix 2)

Enrollment in public four-year colleges: Participating in the Scholars Program in the eighth grade was positively associated with enrollment in a public four-year college (Table 3.2A, Page 34). A Scholar was 4.43 times more likely to enroll in a public four-year college than the non-Scholar when controlling for other variables. In addition to program participation, factors that increased the odds[16] of enrollment in public four-year colleges included:

- Being female, having parents who attended college, living with two parents and coming from an English-speaking home.
- Having A grades in middle school.
- Aspiring to attain a four-year degree.
- Attending high schools with high percentages of Honors diploma graduates.
- Living in towns or suburbs (i.e., urban and rural locales were negatively associated with this outcome).

Participation in the Scholars Program has positive effects independent of the impact of financial aid.

Enrollment in public two-year colleges:

Participation in the Twenty-first Century Scholars Program was also associated with enrollment in public two-year colleges (Table 3.2B, Page 35). Scholars were 6.37 times more likely than non-Scholars to attend a two-year college when controlling for other variables. In addition to participation in the Scholars Program, other factors that increased the odds of enrollment in a two-year college included:

- Being female, African-American and speaking English at home.
- Attending high schools with low percentages of minorities.
- Living in urban or rural locales.

Probable enrollment in private colleges:

Participating in the Twenty-first Century Scholars Program was positively associated with enrollment in a private college in Indiana (Table 3.2C, Page 36). Scholars were 6.13 times more likely than non-Scholars to enroll in private college when controlling for other variables. Other factors that increased the probability of enrollment in private colleges included:

- Being female, having parents who attended college and living with two parents.
- Having A grades in middle school.

Probable enrollment out of state:

Being a Twenty-first Century Scholar was positively associated with probable enrollment out of state (Table 3.2D, Page 37). Scholars were 2.55 times more likely to enroll out of state, controlling for other variables. This is a less substantial effect than for the in-state colleges. Scholars enrolling out of state *did not receive state grants* including the Scholars grant. Nevertheless, this analysis reveals that participation in the Scholars Program has positive effects independent of the impact of financial aid. However, as one would expect, the effects were more substantial when aid was also awarded (i.e., when Scholars enrolled in state). In addition to the Scholars Programs, other variables that increased the odds of out-of-state enrollment included:

- Being female and African-American, having parents who attended college and living with both parents.
- Receiving mostly A grades in middle school.
- Planning to attain a four-year degree or higher.

Impact on persistence

The persistence analysis (Table 4.2, Page 41) used a logistic regression to assess the effects of student aid packages on within-year persistence during the freshman year in a public college in Indiana, controlling for other factors. Receiving a student aid package with a Twenty-first Century Scholars award was positively associated with persistence when compared to not receiving aid (increasing the probability of persistence by 2.0 times). In addition, receiving an aid package without a Twenty-first Century Scholars award was positively associated with persistence (increasing

the probability of persistence by 1.9 times) when compared to students who did not receive aid. Even though low-income students received more aid, this study indicates that the additional grant aid received by Twenty-first Century Scholars had virtually the same effect on persistence as students who received a financial aid package without the Twenty-first Century scholarship. Some question whether the additional aid awarded to Twenty-first Century Scholars provides "added value."[17] Descriptive statistics reveal that 86 percent of Twenty-first Century Scholars continued enrollment during the first year of college, as did 89 percent of non-Scholar aid recipients and 85 percent of students who did not receive financial aid.[18]

Even so, participation in the Twenty-first Century Scholars Program was positively associated with continuous enrollment during the freshman year. Low-income, middle-low-income and upper-middle-income students were less likely to persist than students who did not apply for student aid. Upper-income students had the same chances of persistence as students who did not apply for student aid. However, students receiving Twenty-first Century Scholars awards were 2.0 times more likely to persist than students who did not receive aid (i.e., students who did not even need an unsubsidized loan). Thus, income and the receipt of aid had offsetting effects in persistence. That is, the negative effects of low income on persistence were offset by the positive effects of student aid.

The persistence analysis also showed that:

- Aspiring to attain a two-year degree and being undecided or having no response about aspirations in ninth grade reduced the odds of persistence, compared to aspiring to attain a four-year degree.
- Having below C- or C grades in college reduced the odds of persistence during the freshman year.
- Living on campus increased the odds of persistence.
- Attending a non-research four-year college or a two-year college reduced the odds of persistence compared to attending a Research-Extensive university campus (i.e., the main campuses of Purdue University and Indiana University).

Discussion of evaluation findings

The overall rate of college enrollment by Indiana high school graduates in the 1990s outpaced a similar increase nationally. The Twenty-first Century Scholars Program, along with the generally available support services provided by ICPAC, could have influenced these relative gains in access. The analyses of access and persistence confirm that the Twenty-first Century Scholars Program had a direct, measurable impact on enrollment in college (any type). It also shows that the program does not affect persistence in public colleges differently than does receipt of a typical financial aid package, controlling for income.[19] The program improves enrollment through its encouragement services and the promise of student financial assistance. The results from the persistence analysis again confirm the positive impact of financial aid on persistence in Indiana, but questions remain about the "value added" by the additional grants provided by the Twenty-first Century Scholars Program.[20]

The Twenty-first Century Scholars Program has a direct, measurable impact on enrollment in college.

However, if low-income students never enroll in college, they clearly cannot attain any postsecondary education. To understand the impact of the Twenty-first Century Scholars Program on attainment, it is necessary to consider the combined effects of financial aid on both access and persistence (St. John and Masten,

1990). If students gain access to college (i.e., plan to go, prepare and enroll) because of supplemental aid and persist as well as students who received typical financial aid, then their postsecondary attainment can be attributed to the supplemental aid they received. Because the Twenty-first Century Scholars awards increased the chances that low-income students will enroll in college, and because these students persisted as well as did other financial aid recipients, we can conclude that the program substantially increased the number of low-income students who attained at least one year of college.

The program is a success because it encourages low-income students to prepare for college, provides support services for students and their families, and provides a promise of additional student aid.

Two types of additional analyses may help resolve this question about "value added" in the persistence process. If the promise of additional financial aid as a reward for college preparation (i.e., "merit" aid[21]) influences more students to prepare for college and these new students are just as likely to persist as other low-income students, then the program improves the level of attainment for the population. Since this study shows that the program has a substantial direct effect on enrollment, it is clear that participation in the program increases the number of low-income students who prepare for college and who enroll. In other words, it is plausible that the promise of funding implicit in the Twenty-first Century Scholars program reduces parental and student concerns about college costs and thus encourage preparation. It will be necessary to assess the impact of participation in the Twenty-first Century Scholars Program on academic preparation to further document the effects of the Scholars Program on attainment.[22] It is also possible that students in the Scholars Program will persist better from year to year, an issue that should be further examined as this population progresses through college.

As this report shows, the monetary effects of the Twenty-first Century Scholars Program are intertwined with the effects of the services provided by the program and with the gains in academic preparation that result from program participation. This analysis concludes that the program is a success because it encourages low-income students to prepare for college, provides support services for students and their families, and provides a promise of additional student aid. Further, the "merit" aspect of the program may provide an additional incentive for low-income children to prepare for college. It is difficult to reach a firm conclusion about whether the grant aid provided by the Scholars program has an effect beyond that of the aid students might have otherwise received. Although the additional Scholars grant aid appears to improve academic preparation and postsecondary access among those who would not have otherwise attended college, the direct effect of Twenty-first Century financial awards on persistence remains an open question.[23]

Indiana expanded access for low-income students even though it lacks a well-developed community college system. In the past two years, the State of Indiana has begun to fund the development of a community college system. Historically, most students gaining access through the Twenty-first Century Scholars Program enrolled in public and private four-year colleges. If the community college system develops in Indiana, it will be important to monitor whether there are any changes in financial access to four-year colleges by academically prepared, low-income Hoosiers. Continuation of the Twenty-first Century Scholars Program should help ensure that financial access to four-year colleges is maintained for low-income Hoosiers who prepare for college.

Conclusions and implications

Expanding access to college remains a goal for many states. Improving academic preparation, a process that has been the focus of national reform efforts, is certainly an aspect of that challenge. However, if postsecondary encouragement is consistently provided in a state, along with a guarantee of adequate financial aid, the chances of improved access are enhanced.

Indiana's Twenty-first Century Scholars Program provides a model that other states can follow in efforts to improve postsecondary access. The program is based on a set of promises made with students in the eighth grade. Students promise to take the steps necessary to prepare for college, while the state promises to provide support services and additional student grant aid. The Scholars Program offers an array of support services through regional service centers and provides additional grant awards on top of the typical state grant program for all Scholars with remaining financial need. These additional services are provided in a state that is among the leaders in providing student grant aid (DeSalvatore and Hughes, 2000) and is distinctive in the level and quality of information provided to all high school students about postsecondary and career opportunities (Hossler and Schmit, 1995).

This study confirms that the Twenty-first Century Scholars Program improves postsecondary access for low-income students in Indiana. Indeed, the statistical analyses show that participation in the program had direct and positive effects on enrollment in college (all types). Thus, not only has Indiana improved its college enrollment rate compared to other states, but through the Twenty-first Century Scholars Program, the state has increased the chances of college enrollment for low-income students who participate in the program. This results in higher postsecondary education attainment for these students.

Indiana's Twenty-first Century Scholars Program provides a model that other states can follow in efforts to improve postsecondary access.

However, the study also shows that not all eligible students benefited equally from the Scholars Program because of disparities in high school curricula across the state. Students from

urban and rural schools were less likely to graduate from high schools that emphasized Honors diplomas (Appendix 1, Page 24), which were associated with increased enrollment in public four-year colleges.[24] The State of Indiana should further investigate the extent and impact of changes in high school curriculum on postsecondary opportunity. To address this preparation issue, the state has taken steps to test a program that pays tuition and fees for Scholars to enroll in summer programs to take preparatory courses in the summer before or after they enroll in college (see Appendix 5, Page 45). Funded through GEAR UP, this scholarship is a one-time non-renewable award.

Finally, the study shows that adequate student financial assistance is an essential component of state education policy if that policy aims to ensure financial access for low-income students who prepare academically for college. Recent analyses reveal that 22 percent of college-qualified low-income students do not attend college (Advisory Committee on Student Financial Assistance, 2002; NCES, 1997; St. John, in press). Indeed, because of dwindling federal grants, there is growing nationwide inequality in the opportunity to attend college for low-income students compared to high-income students. In this context, need-based state grants are crucial. The Twenty-first Century Scholars Program illustrates that financial assistance and encouraging academic preparation can improve access for low-income students if the two strategies are coordinated effectively.

Appendices

Appendix 1
Trends in indicators of achievement and access

Trends in key indicators of educational outcomes can be used to discern the types of impacts that could be associated with the postsecondary encouragement services in Indiana in general and, more specifically, with the Twenty-first Century Scholars Program. First, indicators associated with improvement in K-12 education are examined as a conceptual control for the effects of the state's efforts to upgrade high school curriculum. Then, indicators of postsecondary access are examined as a way of discerning whether there is an obvious case that ICPAC, the Twenty-first Century Scholars Program and other SSACI grants influenced access for academically prepared, low-income students.

Indicators of student achievement

Many school reform advocates say that achievement outcomes are the appropriate indicators for education reform (Finn, 1990; Finn, Manno and Ravitch, 2001) and that K-12 reform should precede efforts to improve equity in student aid (Finn, 2001). Whether or not one agrees with this position, analysts need to consider, and conceptually control for, the effects of K-12 reform on achievement when examining the role of student aid in promoting equity.

Because Indiana has made substantial efforts to improve high school curriculum, it is important to consider whether these efforts improved student achievement before considering indicators of postsecondary access. Two indicators of achievement outcomes are used: 1) passage of advanced placement examinations and 2) SAT scores and state rankings.

Advanced placement

In addition to making changes in high school curriculum that better define the courses students should take to prepare for a four-year college, Indiana has provided a financial incentive for high schools to increase the percentage of students who take advanced placement exams. For more than a decade Indiana has paid for these exams, thus creating a financial incentive for schools to expand AP courses. This outcome could, in theory, improve college access. Trends in advanced placement are summarized in Table 1.1.

The percentage of students taking advanced placement exams did not change substantially between 1995-96 and 2000-01, staying within the 7 percent range over the period (Table 1.1, Part

Table 1.1
Trends in advanced placement exams

Part A. Percent of students taking an advanced placement exam in Indiana high schools by high school locale

Locale	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01
Large city	6.14	5.33	5.13	6.36	7.46	7.94
Mid-size city	7.49	5.89	5.89	6.06	6.87	7.62
Urban fringe of large city	8.11	7.40	7.31	7.11	7.54	8.42
Urban fringe of mid-size city	7.72	6.12	5.88	6.82	7.45	7.58
Large town	9.02	8.14	7.82	9.88	8.78	9.00
Small town	7.14	6.43	6.57	6.80	6.91	6.93
Rural outside MSA	8.17	7.81	8.41	7.75	8.15	8.10
Rural inside MSA	8.43	7.76	7.54	8.11	7.65	7.32
Total	7.86	7.07	7.14	7.29	7.53	7.71

Source: Indiana Department of Education, online at IDEANET

Part B. Percent of students who take an advanced placement exam who pass in Indiana high schools by high school locale

Locale	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01
Large city	41.58	47.84	48.10	37.74	36.80	40.72
Mid-size city	32.23	36.57	38.34	38.70	43.04	39.71
Urban fringe of large city	26.66	29.23	38.58	38.27	39.26	39.14
Urban fringe of mid-size city	28.77	34.04	42.88	40.33	40.21	39.97
Large town	41.79	46.57	46.77	42.77	45.43	42.21
Small town	28.25	34.66	35.58	36.14	33.92	35.65
Rural outside MSA	23.20	25.70	27.02	23.12	21.68	22.30
Rural inside MSA	29.71	31.47	36.98	34.03	35.30	36.65
Total	28.41	32.01	36.05	33.90	34.20	34.83

Source: Indiana Department of Education, online at IDEANET

Part C. Percent of all students who pass in Indiana high schools by high school locale

Locale	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01
Large city	2.55	2.55	2.47	2.40	2.75	3.23
Mid-size city	2.41	2.15	2.26	2.35	2.96	3.03
Urban fringe of large city	2.16	2.16	2.82	2.72	2.96	3.30
Urban fringe of mid-size city	2.22	2.08	2.52	2.75	3.00	3.03
Large town	3.77	3.79	3.66	4.23	3.99	3.80
Small town	2.02	2.23	2.34	2.46	2.34	2.47
Rural outside MSA	1.90	2.01	2.27	1.79	1.77	1.81
Rural inside MSA	2.50	2.44	2.79	2.76	2.70	2.68
Total	2.23	2.26	2.57	2.47	2.58	2.69

Source: Calculated from data available from the Indiana Department of Education, online at IDEANET

A). Thus, changes in high school curriculum and incentives to encourage students to take the tests appear to have had little effect on test taking. There is some variation in the trends across schools in different locales. There was a slight increase in the percentage of students in large cities taking these exams (from 6.14 percent in 1995-96 to 7.94 percent in 2000-01) and a slight decline in rural locales inside of MSAs (from 8.43 percent to 7.32 percent). Otherwise, there was little change in test-taking behavior across different locales.

Second, there were discernible changes in the pass rates on the advanced placement exams during this period, with a statewide increase from 28.41 percent in 1995-96 to 34.83 percent in 2000-01 (Table 1.1, part B). However not all types of locales showed an improvement in pass rates. Specifically, the average pass rate in districts located in large cities oscillated substantially across the periods and was slightly lower in 2000-01 (40.72 percent) than in 1995-96 (41.58 percent). All other types of districts were relatively stable or showed an improvement in the rate of passing advanced placement examinations. While these changes are modest, there is evidence to argue that improvement in the high-school curriculum enabled more students to pass advanced placement exams. However, a more sophisticated statistical analysis would be needed to confirm this relationship.[25]

Substantial improvement is needed in the methods used to compare SAT scores across states.

Finally, when the percentage of students passing advanced placement exams was examined (Table 1.1, Part C) there was a slight improvement in the percentage of students passing advanced placement tests across all but one locale type. The overall percentage passing increased slightly from 2.23 percent in 1995-96 to 2.69 percent in 2000-01. Districts in large cities had an increase in the percentage passing, from 2.55 percent to 3.23 percent, while schools in rural areas inside of MSAs had an increase from 2.5 percent to 2.68 percent. Thus there was a very modest pattern of improvement in the percentage of students passing advanced placement tests. At the very least, the influence of high school curriculum on passage rates for AP exams merits further study using sound statistical models with appropriate data.

SAT scores

Substantial improvement is needed in the methods used to compare SAT scores across states, due to variations in the percentage of students taking the tests, demographic indicators, academic preparation and so forth. However, because these tests often are treated as an indicator of the quality of state systems of education, it is appropriate to consider trends in SAT scores as a logical control of the impact of school reform on college access.

A relatively high percentage of Indiana high school students take the SAT, which complicates comparisons of Indiana students' scores to the national averages (Table 1.2). Therefore, better statistical controls are needed to interpret the simple ranking of the state on SAT scores, which has changed modestly over time. Math scores did not change appreciably over time. However, there was a slight improvement in the average verbal SAT scores in Indiana after the improvements were made in high school curriculum. The average score in Indiana was 15 points below the national average in 1987 (492 compared to 507) and 11 below in 1994 (488 compared to 499). However, the Indiana score was only 7 points below the national average in both 2000 (498 compared to 505) and in 2001 (499 compared to 506). Whether these improvements are attributable to improvements in high school curriculum merits further analysis.

Among states with high percentages of students taking SAT exams, Indiana average score ranks high and has improved its ranking comparatively among these studies.[26] Future analyses will consider the impact of changes in high school

Table I.2
Trends in SAT scores and percentages of students taking the SAT in Indiana and the U.S.

	INDIANA			NATIONAL AVERAGES		
	Verbal	Math	Percent taking SAT	Verbal	Math	Percent taking SAT
1987	492	487	N/A	507	501	N/A
1988	490	486	N/A	505	501	N/A
1989	490	487	N/A	504	502	N/A
1991	485	485	57	499	500	42
1993	487	487	61	500	503	43
1994	488	493	60	499	504	42
1995	492	494	58	504	506	41
1996	494	494	57	505	508	41
1997	494	497	57	505	511	42
1998	497	500	59	505	512	43
1999	496	498	60	505	511	43
2000	498	501	N/A	505	514	N/A
2001	499	501	60	506	514	45

All SAT scores are recentered scores. Indiana ranked 15th among states in the percentage of students taking the SAT in 2001.

curriculum on improvement in SAT scores in Indiana and other states, but such analyses were beyond the scope of this study.

Understanding achievement outcomes

These analyses reveal a modest relationship between improvement in high school curriculum and improvements in achievement outcomes for high school students. Further analyses with improved statistical controls would be needed to confirm that these modest improvements are related to changes in high school curriculum. However, because these improvements are modest, we would expect that the effects of achievement on college access have changed little over time.

Indicators of college access

When assessing the effects of academic preparation and of financial aid, it is important to distinguish between high school graduation rates (an outcome of K-12 education that is related to equity) and college-continuation rates by high school graduates (an access outcome attributable to K-12 education and financial aid). Logically, need-based financial aid can increase the percentage of high school graduates who enroll in college, as well as improve the opportunity to persist for students with different financial means, but these effects are not independent of the impact of school reform (St. John and Musoba, in press).

High school graduation rates

High school graduation rates provide an equity-related indicator to measure the effects of high school preparation that also relates indirectly to college access. Nationally, high school graduation rates have not improved after 20 years of intensive federal and state efforts to raise education standards (St. John, in press). Research using a national database (the National Educational Longitudinal Study of 1988) indicates that

high-stakes graduation tests, the penultimate standards-driven strategy, have no effect on the probability of graduation and are negatively associated with graduation by low-income students

Table 1.3
Indiana and national high school graduation rates from 1986 to 1998

Year	Indiana	U.S.	Indiana's rank
1986	76.2%	73.4%	25
1988	78.1	72.7	17
1992	76.0	71.2	27
1994	71.3	70.0	33
1996	70.1	67.9	31
1998	70.8	67.8	29

Source: Compiled from data published by *Postsecondary Education Opportunity*, August 2000.

http://www.postsecondary.org/archives/Reports/Spreadsheets/Chance%20for%20College%20by%20Age%2019%20by%20State%2082000.htm

(Jacobs, 2001). An Indiana study found that the implementation of high-stakes graduation tests was associated with lower graduation rates for special-education students and for low-income students in urban schools (Manset and Washburn, in press).

Indiana high school graduation rates have been consistently higher than the national average, but graduation rates have dropped in Indiana and nationally (Table 1.3). Between 1986 and 1998 (a year before high-stakes graduation testing was implemented in Indiana), graduation rates in Indiana fell from 76.2 percent to 70.8 percent. This compares to a drop from 73.4 percent to 67.8 percent in the national average. The Indiana graduation rate and the national rate declined a similar amount (a 5.4 percentage points drop in Indiana compared to a 5.6 percentage points drop nationally). However, Indiana's ranking among states on graduation rates also fell — from 25th in 1986 to 29th in 1998 (and Indiana ranked as low as 33rd, in 1994).

These trends provide an equity indicator of the effect of school reform on access nationally and in Indiana. Raising standards, changing high school degree programs, and increasing the emphasis on tests have not improved high school graduation rates. These reductions in graduation may offset the modest improvements in test-passing rates noted above because students who take the SAT and advanced placement exams are more likely to attend college anyway (NCES, 1997).

College transitions

College enrollment by high school graduates provides another indicator of the effects of academic preparation, but it can also be influenced by student aid (St. John, in press). Enrollment is an appropriate indicator for assessing the impact of ICPAC, since ICPAC provides postsecondary encouragement for all high school students and has been used in prior descriptive studies (Hossler and Schmit, 1995).

College enrollment by high school graduates has improved in Indiana, as it has nationally (Table 1.4). The continuation rate in Indiana rose from 37.5 percent in 1986 to 60.5 percent in 1998, a more pronounced increase than was seen nationally (43.1 percent to 57.2 percent during the same

Table 1.4
College-continuation rates between 1986 and 1998 for Indiana and the nation

Year	Indiana	U.S.	Indiana's rank
1986	37.5%	43.1%	40
1988	44.8	47.8	29
1992	50.5	54.3	34
1994	55.0	57.1	26
1996	57.9	58.5	20
1998	60.5	57.2	17

Source: Compiled from data published by *Postsecondary Education Opportunity*, August 2000.

http://www.postsecondary.org/archives/Reports/Spreadsheets/Chance%20for%20College%20by%20Age%2019%20by%20State%2082000.htm

period). In 1986 Indiana ranked 40th among states; by 1998 it was 17th — clearly a substantial improvement.

Although college-continuation rates are appropriately considered an outcome of postsecondary encouragement, this outcome can also be influenced by improvement in academic preparation. Since high school curriculum in Indiana has followed national patterns, it is appropriate to attribute a portion of the improvement in college-continuation rates to this cause in Indiana and nationally. However, the fact that Indiana has increased its participation rate relative to other states is a good indicator that the postsecondary encouragement services provided by ICPAC had a positive influence in Indiana (Hossler and Schmit, 1995). However, since relatively few students qualify for Twenty-first Century Scholarships, the effects of this particular program on continuation rates are probably modest.

Appendix 2
Database design

Data sources

Five data sources contributed information for the merged database used in this analysis.

1. The Indiana Career and Postsecondary Advancement Center (ICPAC) conducts an annual survey of all Indiana ninth-graders regarding their career and educational aspirations, family living situation, current grades, etc. The ninth-grade survey contained key predictor variables and included students who would fall into all of the possible outcome categories. With about an 80 percent response rate, this provides a good representation of Indiana students as they enter high school. This data set had 65,975 observations.

2. ICPAC also provided accurate records of the Indiana students who had applied for and enrolled in the Scholars Program in eighth grade. This data set contained 5,035 records of students who applied for the Scholars Program.

3. The Indiana Commission for Higher Education collects from public colleges and universities records regarding each student who attends. The Student Information System (SIS) records include cumulative grade point average, SAT scores, high school attended, degree plans, other campuses attended, credits earned, campus living situation, family income, demographic information and financial aid records — including receipt of a Twenty-first Century Scholarship. The SIS data set had 275,130 observations including all undergraduates.

4. The State Student Assistance Commission of Indiana (SSACI), which administers the state grants, provided access to students' Free Application for Federal Student Aid (FAFSA) records, which offered data similar to the SIS records for students who applied to go to private and out-of-state higher education institutions. For instance, the records indicated whether the student received a state grant (indicating they went to an in-state institution) or whether they

applied for aid for an out-of-state school. SSACI data contained records for all students from Indiana who applied for financial aid regardless of attendance. The data set had 106,097 observations including undergraduates born in 1980-1982 (students who would be in ninth grade in 1995).

5. The Indiana Department of Education's Web-based school data records provided high school information such as the percent of students receiving Free or Reduced Lunches (a rough measure of poverty), the percent of graduates who earned an Honors diploma, and other institutional variables.

The SIS and FAFSA records were merged using student identification numbers. Because the ninth-grade surveys did not have identification numbers, a concatenation of the student's birth date, high school code, gender, ethnicity and home zip code was used to match records. Progressive combinations of this concatenation from most restrictive (i.e., all of the variables) to least restrictive were applied. In the first matches, variables from the SIS data were matched. When that was exhausted, a concatenation of first and last name, birth date, and gender was used to match remaining survey records with FAFSA records. A total of 21,615 observations were found in both the SIS and FAFSA data files. All observations were retained in the file because students who did not match with the SIS or FAFSA file had no evidence of higher education enrollment and represented the reference group in the multinomial regression modeling. Finally, high-school-level variables were matched to the observations using the high school code unique to each Indiana high school. This produced a database of 65,975 cases, of which 63,169 have no missing values and were used in the multinomial regression on college destinations.

Of this data set, 25,823 students had attended a public two- or four-year college in Indiana and were considered in the persistence analysis. Of those, 23,120 cases had no missing values and were included in the logistic regression on persistence.

Appendix 3
Analysis of college destinations

The multinomial logistic regression analysis examined the effect of participation in the Twenty-first Century Scholars Program on college enrollment (in public two-year, public four-year, or private college) compared to non-enrollment. The analysis examined the effects of:

- **Family background**: Variables related to gender, ethnicity, parents' education, parents in the home and language spoken at home.
- **Scholars**: Participation in the Twenty-first Century Scholars Program compared to non-participation.
- **Experience and achievement in school**: Variables related to grade point average in ninth grade, high school locale, students' aspirations, high school Honors programs and percentage of minorities in the high school.

All 65,975 cases were used in a multinomial regression examining college enrollment and a set of predictor variables. Possible outcomes included attending an Indiana public four-year or two-year college, probably attending an Indiana private college, probably attending an out-of-state public or private college, and a group of students for whom there was no evidence of college enrollment. Using a Boolean process, students who had attended Indiana public four-year and then two-year institutions were assigned to groups. Students who had either received aid to attend a private in-state institution or applied for aid at a private institution and not attended a public institution were assigned to a different group. Students who had applied for financial aid to attend an out-of-state institution and who were not present in data sources that indicated in-state attendance were assigned to a fourth group. Remaining students were assigned to the reference group, which represented students who did not enroll at any institution or apply for aid to attend an out-of-state or private institution. There may be some errors in assignment, but those errors are minor and the limitations of the data prohibited greater accuracy.

The descriptive statistics for the variables included in the multinomial analysis are presented in Table 3.1. The results of the multinomial analysis are presented in Table 3.2, Parts A (Public Four-Year), B (Public Two-Year), C (Private Institutions) and D (Out of State). These tables explain the variable coding using full variable descriptions.

Table 3.1
Descriptive statistics for variables in the multinomial regression

Variable	Values	Number of cases	Percentage
Enrollment status in first year out of high school	Public four-year enrollment	22,607	35.8
	Public two-year enrollment	4,751	7.5
	Private, in-state enrollment	5,251	8.3
	Expressed intentions for out-of-state enrollment	3,602	5.7
	No evidence of enrollment in any institution	26,958	42.7
Gender	Female	30,502	48.3
	Male and unknown	32,667	51.7
Ethnicity	Missing or prefer not to answer	10,499	16.6
	Other minority	3,986	6.3
	African-American	4,083	6.5
	White	44,601	70.6
Parent education level	Parent(s) went to college	20,151	31.9
	No college for parent(s) or unknown parent education level	43,018	68.1
Who the student lived with in ninth grade	Live with one parent	11,433	18.1
	Do not live with parent	1,867	3.0
	Live with two parents or unknown living sit.	49,869	78.9
Main language spoken in student's home	Spanish or other language	727	1.2
	English	62,442	98.8
Twenty-first Century Scholar status	Yes, a Scholar	2,097	3.3
	No, not a Scholar	61,072	96.7
Grade point average in ninth grade	Missing/did not answer	3,590	5.7
	Mostly A's	6,392	10.1
	Mixed B's and C's and Mostly C's	21,345	33.8
	Mixed C's and D's or lower	6,716	10.6
	Mixed A's and B's and Mostly B's	25,126	39.8
Locale of high school student attended	Urban	10,055	15.9
	Rural	12,395	19.6
	Urban fringe, town and unknown	40,719	64.5
Student's aspirations for education completion in ninth grade	Undecided/other/no response	10,965	17.4
	Aspire to a high school diploma or less	5,001	7.9
	Aspire to less than a two-year degree	3,526	5.6
	Aspire to a two-year degree	4,998	7.9
	Aspire to a four-year degree or higher	38,679	61.2
Percent of graduates in the student's high school who earned an Honors diploma	High percentage of Honors graduates (25% of high schools)	16,297	25.8
	Low percentage of Honors graduates (75% of high schools in Indiana)	46,872	74.2
Percentage of students in the student's high school who are minorities	High minority concentration (25% of high schools)	15,705	24.9
	Low minority concentration (75% of high schools)	47,464	75.1
Valid cases		63,169	100.0
Cases with missing values		2,806	
Total number of cases		65,975	

Table 3.2A
Multinomial regression analysis of variables associated with first-year college enrollment in 1999 at public four-year institutions

Dependent variable: enrollment status first year after high school.
Comparison group for college enrollments is no evidence of enrollment at any institution.

Variables	Coefficient	Std. err.	Odds ratio	Sig
Female compared to male	0.169	0.020	1.184	***
When compared to whites:				
Missing ethnicity/did not answer	-0.141	0.030	0.868	***
Other minorities	-0.234	0.041	0.792	***
African-American	-0.036	0.046	1.964	
Parents went to college compared to no or unknown parent higher education	0.244	0.022	1.277	***
When compared to living with two parents:				
Living with one parent	-0.239	0.026	0.788	***
Do not live with parent	-0.458	0.062	0.633	***
Spanish or other language at home compared to English:	-0.209	0.094	0.812	*
Yes, a Twenty-first Century Scholar compared to no, not a Scholar	1.489	0.068	4.432	***
When compared to A's and B's:				
No reported GPA	-0.434	0.052	0.648	***
Mostly A's	0.263	0.035	1.304	***
B's and C's	-0.839	0.024	0.432	***
C's and D's and below	-1.137	0.040	0.321	***
When compared to plans for a four-year degree or higher:				
Undecided about education future	-0.506	0.031	0.603	***
Plans for a high school diploma only	-0.849	0.044	0.428	***
Plans for less than a two-year degree	-0.821	0.049	0.44	***
Plans for a two-year degree	-0.613	0.039	0.542	***
High percentage Honors diploma grads in high school (compared to low percentage)	0.203	0.023	1.224	***
High percentage minority students in high school (compared to low percentage minority)	-0.024	0.027	0.976	
When compared to suburban/town/unknown:				
Urban school locale	-0.171	0.030	0.843	***
Rural school locale	-0.184	0.026	0.832	***

*** p<.001, ** p<.01, * p<.05

Model Statistics for Multinomial Regression

-2 Log likelihood	31950.380
Chi-square	9597.820 ***
Cox and Snell	.142

Table 3.2B
Multinomial regression analysis of variables associated with first-year college enrollment in 1999 at public two-year institutions

Dependent variable: enrollment status first year after high school.
Comparison group for college enrollments is no evidence of enrollment at any institution.

Variables	Coefficient	Std. err.	Odds ratio	Sig
Female compared to male	0.096	0.032	1.101	**
When compared to whites:				
Missing ethnicity/did not answer	-0.038	0.047	0.963	
Other minorities	-0.256	0.072	0.774	***
African-American	0.374	0.069	1.453	
Parents went to college compared to no or unknown parent higher education	-0.038	0.038	0.963	
When compared to living with two parents:				
Living with one parent	-0.141	0.042	0.868	***
Do not live with parent	-0.379	0.096	0.684	***
Spanish or other language at home compared to English:	-0.586	0.188	0.556	**
Yes, a Twenty-first Century Scholar compared to no, not a Scholar	1.852	0.082	6.374	***
When compared to A's and B's:				
No reported GPA	0.024	0.082	1.024	
Mostly A's	-0.571	0.084	0.565	***
B's and C's	-0.005	0.038	0.995	
C's and D's and below	-0.441	0.062	0.643	***
When compared to plans for a four-year degree or higher:				
Undecided about education future	-0.251	0.049	0.776	***
Plans for a high school diploma only	-0.637	0.068	0.529	***
Plans for less than a two-year degree	-0.349	0.068	0.706	***
Plans for a two-year degree	0.009	0.053	1.009	
High percentage Honors diploma grads in high school (compared to low percentage)	-0.018	0.039	0.983	
High percentage minority students in high school (compared to low percentage minority)	-0.414	0.049	0.661	***
When compared to suburban/town/unknown:				
Urban school locale	0.170	0.049	1.186	***
Rural school locale	0.175	0.040	1.192	***

*** p<.001, ** p<.01, * p<.05

Table 3.2C
Multinomial regression analysis of variables associated with first-year college enrollment in 1999 at private institutions

Dependent variable: enrollment status first year after high school.
Comparison group for college enrollments is no evidence of enrollment at any institution.

Variables	Coefficient	Std. err.	Odds ratio	Sig
Female compared to male	0.075	0.031	1.078	*
When compared to whites				
Missing ethnicity/did not answer:	-0.112	0.048	0.894	*
Other minorities	-0.337	0.072	0.714	***
African-American	0.072	0.074	1.075	
Parents went to college compared to no or unknown parent higher education:	0.225	0.035	1.252	***
When compared to living with two parents:				
Living with one parent	-0.217	0.043	0.805	***
Do not live with parent	-0.387	0.102	0.679	***
Spanish or other language at home compared to English:	-0.410	0.174	0.664	*
Yes, a Twenty-first Century Scholar compared to no, not a Scholar	1.813	0.083	6.126	***
When compared to A's and B's:				
No reported GPA	-0.393	0.086	0.675	***
Mostly A's	0.731	0.049	2.078	***
B's and C's	-0.676	0.040	0.509	***
C's and D's and below	-0.769	0.064	0.464	***
When compared to plans for a four-year degree or higher:				
Undecided about education future	-0.264	0.050	0.768	***
Plans for a high school diploma only	-0.494	0.070	0.610	***
Plans for less than a two-year degree	-0.495	0.078	0.609	***
Plans for a two-year degree	-0.508	0.067	0.602	***
High percentage Honors diploma grads in high school (compared to low percentage)	0.065	0.036	1.067	
High percentage minority students in high school (compared to low percentage minority)	-0.117	0.044	0.890	**
When compared to suburban/town/unknown:				
Urban school locale	-0.105	0.049	0.900	*
Rural school locale	0.043	0.040	1.044	

*** p<.001, ** p<.01, * p<.05

Table 3.2D
Multinomial regression analysis of variables associated with first-year college enrollment in 1999 at out-of-state institutions

Dependent variable: enrollment status first year after high school.
Comparison group for college enrollments is no evidence of enrollment at any institution.

Variables	Coefficient	Std. err.	Odds ratio	Sig
Female compared to male	0.099	0.036	1.104	**
When compared to whites:				
Missing ethnicity/did not answer	0.063	0.054	1.065	
Other minorities	-0.131	0.078	0.877	
African-American	0.385	0.074	1.470	***
Parents went to college compared to no or unknown parent higher education	0.282	0.040	1.326	***
When compared to living with two parents:				
Living with one parent	-0.114	0.048	0.892	*
Do not live with parent	-0.301	0.110	0.740	**
Spanish or other language at home compared to English:	-0.372	0.188	0.690	*
Yes, a Twenty-first Century Scholar compared to no, not a Scholar	0.936	0.115	2.549	***
When compared to A's and B's:				
No reported GPA	-0.264	0.097	0.768	**
Mostly A's	0.495	0.061	1.641	***
B's and C's	-0.426	0.045	0.653	***
C's and D's and below	-0.539	0.070	0.583	***
When compared to plans for a four-year degree or higher:				
Undecided about education future	-0.234	0.057	0.791	***
Plans for a high school diploma only	-0.502	0.078	0.606	***
Plans for less than a two-year degree	-0.226	0.080	0.798	**
Plans for a two-year degree	-0.290	0.071	0.748	***
High percentage Honors diploma grads in high school (compared to low percentage)	0.082	0.043	1.086	
High percentage minority students in high school (compared to low percentage minority)	0.065	0.050	1.067	
When compared to suburban/town/unknown:				
Urban school locale	-0.023	0.053	0.978	
Rural school locale	0.044	0.048	1.045	

*** p<.001, ** p<.01, * p<.05

Appendix 4
Analysis of persistence

The persistence analysis examines the effects of the aid packages for freshmen in public colleges. In addition to assessing the effects of aid, the analysis examines the effects of:

- **Student background**: Variables related to gender, parents' education, parents in the home and language spoken at home.
- **Preparation**: Variables related to grade point average in high school, locale of high school, students' aspiration, high school honor's programs, ethnicity of the high school and poverty level in the high school.
- **Financial means**: Variables related to family income and dependency status.
- **College context and achievement**: Variables related to grade point average in college, living situation in college and type of institution attended.
- **Aid packages**: Students who received packages with Twenty-first Century Scholarships or other aid packages were compared to students who did not receive aid, controlling the variables noted above.

For the logistic regression modeling of college within-year persistence, a total of 25,823 observations were used, representing all students who had completed a survey and attended one of Indiana's public higher education institutions. Because full data were not available on private or out-of-state students, they were removed from the data set for the persistence analysis. The descriptive statistics for the logistic regression analysis are presented in Table 4.1 (Pages 39 and 40).

As noted in Table 4.1, 2,703 cases did not include all of the information needed for the logistic regression. Most of the missing cases resulted from a lack of information about high school locale.

The logistic regression analysis uses a set of design variables to control for income effects. Students who had their income reported (i.e., students who applied for student aid) were separated into four categories and compared to students who did not have incomes reported (i.e., students who did not apply for student financial aid). The four income groups of aid applicants (i.e., students for whom income is reported) were:

- Lower income (below $30,621).
- Lower-middle income (from $30,621 to $52,719).

- Upper-middle income (above $52,719 to $75,356).
- Upper income (above $75,356).

The results of the logistic regression analysis are presented in Tables 4.2 and 4.3 (Pages 41-44).

The full description of the statistical analyses will be released in subsequent technical reports. The results are summarized in this report.

Table 4.1
Descriptive statistics for variables in the logistic regression for freshmen enrolled in Indiana's public colleges in 1999-2000

Variable	Value	Percentage
Gender	Female	52.3
	Male and unknown	47.7
Ethnicity	Missing or prefer not to answer	14.3
	Other minority	5.1
	African-American	5.6
	White	75
Parental education level	Parent(s) went to college	37.4
	No college for parent(s) or unknown parent education	62.6
Who the student lived with in ninth grade	Live with one parent	15.8
	Do not live with parent	2
	Live with two parents or unknown living situation	82.2
Main language spoken in student's home	Spanish or other language	0.8
	English	99.2
Grade point average in ninth grade	Missing/did not answer	5
	Mostly A's	13.2
	Mixed B's and C's and Mostly C's	26.3
	Mixed C's and D's or lower	5.6
	Mixed A's and B's and Mostly B's	49.9
Locale of high school student attended	Urban	15.4
	Rural	19.6
	Urban fringe, town and unknown	65
Student's aspirations in ninth grade for education completion	Undecided/other/no response	13.8
	Aspire to a high school diploma or less	4.1
	Aspire to less than a two-year degree	3.4
	Aspire to a two-year degree	6.2
	Aspire to a four-year degree or higher	72.5
Percent of graduates in the student's high school who earned an Honors diploma	Low percentage of Honors graduates	70.7
	High percentage of Honors graduates	29.3

Continued on Page 40

Table 4.1, continued
Descriptive statistics for variables in the logistic regression for freshmen enrolled in Indiana's public colleges in 1999-2000

Variable	Value	Percentage
Percentage of students in the student's high school who are minorities	High minority concentration	22.9
	Low minority concentration	77.1
Percentage of students in the student's school who receive free or reduced-price lunches	High percentage of students	21.5
	Low percentage of students	78.5
Family income quartiles	Low income (below $30,621)	14.1
	Lower-middle income (from $30,621 to $52,719)	14.8
	Upper-middle income (above $52,719 to $75,356)	15
	High income (above $75,356)	15.1
	No reported income (did not apply for financial aid)	41
Dependency status	Self-supporting	1.9
	Dependent on parents	98.1
College cumulative grade point average	A average	12.2
	B average	43.4
	C average	18.3
	Below C	26.1
Living situation while in college	On campus	47.4
	Live off campus, with parents or elsewhere	52.6
Institutional type	Research university	34
	Other four-year	56.2
	Two-year college	9.8
Aid package	Received a Twenty-first Century Scholarship as part of aid	3.4
	Received other financial aid, but *not* a Twenty-first Century Scholarship	46.5
	Did not receive any financial aid	50.1
Within-year persistence rate for each group	Twenty-first Century Scholars	85.8
	Other aid recipients	88.7
	No financial aid students	85.1
Percent of students who enrolled in the Scholars program in eighth grade	4.9	
Valid cases	23,120	
Cases with missing values	2,703	
Total number of cases	25,823	

Table 4.2
Logistic regression analysis of variables associated with within-year persistence by freshmen enrolled in Indiana's public colleges in 1999-2000

Variables	Coefficient	Std. err.	Odds ratio	Sig
When compared to women:				
Male/Unknown gender	0.050	0.044	1.051	
When compared to Whites:				
Black/African-American	0.154	0.099	1.166	
Other minorities	-0.050	0.094	0.952	
Unknown ethnicity	0.023	0.068	1.023	
When compared to parents did not go to college or unknown parent education:				
Parents went to college	0.066	0.049	1.0695	
When compared to living with two parents:				
Live with one parent	0.051	0.059	1.052	
Do not live with parents	-0.123	0.134	0.884	
When compared to students where English is the home language:				
Spanish or other language spoken at home	0.337	0.250	1.401	
When compared to mixed A's and B's and mostly B's:				
Mostly A's	-0.012	0.085	0.988	
Mixed B's and C's and Mostly C's	-0.074	0.052	0.929	
Mixed C's and D's or lower	-0.165	0.093	0.847	
Missing GPA/did not answer	0.104	0.124	1.109	
When compared to students whose income was not reported:				
Low income (below $30,621)	-0.565	0.089	0.568	***
Lower-middle income (from $30,621 to $52,719)	-0.496	0.083	0.609	***
Upper-middle income (above $52,719 to $75,356)	-0.420	0.079	0.657	***
High income (more than $75,356)	-0.101	0.083	0.904	
When compared to being dependent on parents for support or indeterminate dependency status:				
Self-supporting	-0.229	0.134	0.796	
When compared to students from schools in suburban areas or large or small towns:				
Urban locale	-0.017	0.068	0.984	
Rural locale	0.064	0.058	1.066	
When compared to students from schools where more students qualify for free or reduced lunch:				
Fewer students on free/reduced lunch	-0.013	0.062	0.987	

Continued on Page 42

Table 4.2, continued
Logistic regression analysis of variables associated with within-year persistence by freshmen enrolled in Indiana's public colleges in 1999-2000

Variables	Coefficient	Std. err.	Odds ratio	Sig
When compared to students from schools with high concentrations of minority students:				
Low minority concentration in high school	-0.023	0.066	0.978	
When compared to students from schools with few Honors graduates:				
High percentage of Honors graduates in high school	0.066	0.052	1.069	
When compared to students who in ninth grade stated they aspired to a four-year degree or higher:				
Aspire to high school diploma	-0.161	0.106	0.851	
Aspire to less than a two-year degree	-0.061	0.114	0.941	
Aspire to a two-year degree	-0.261	0.081	0.770	**
Aspiration is undecided or no response	-0.162	0.070	0.850	*
When compared to students who earned a B grade point average while in college:				
Below C	-2.073	0.055	0.126	***
C average	-0.278	0.078	0.757	***
A average	0.084	0.108	1.088	
When compared to students who live off campus or with parents while in college:				
On-campus living situation	0.428	0.054	1.534	***
When compared to students attending research universities:				
Two-year college	-0.216	0.096	0.806	*
Other four-year	-0.388	0.063	0.678	***
When compared to students who did not receive any financial aid:				
Aid recipients who also got Twenty-first Century Scholarships	0.697	0.126	2.007	***
Other aid recipients	0.620	0.064	1.858	***
N of cases = 23,120 †				
Model X^2 = 3202.503				
-2 Log likelihood = 14623.675				
Cox & Snell Pseudo R^2 = 0.129				

*** p<.001, ** p<.01, * p<.05

† The total number of observations was 25,823. However, 2,703 observations did not enter the regression because of missing values in one or more variables.

Table 4.3
Logistic regression analysis of variables associated with within-year persistence by freshman financial aid recipients enrolled in Indiana's public colleges in 1999-2000

Variables	Coefficient	Std. err.	Odds ratio	Sig
When compared to women:				
Male/Unknown gender	0.069	0.062	1.072	
When compared to Whites:				
Black/African-American	0.487	0.136	1.627	***
Other minorities	0.060	0.138	1.062	
Unknown ethnicity	0.070	0.095	1.073	
When compared to parents did not go to college or unknown parent education:				
Parents went to college	0.079	0.072	1.083	
When compared to living with two parents:				
Live with one parent	0.077	0.080	1.080	
Do not live with parents	0.054	0.181	1.056	
When compared to students where English is the home language:				
Spanish or other language spoken at home	0.441	0.397	1.555	
When compared to mixed A's and B's and mostly B's:				
Mostly A's	0.109	0.121	1.115	
Mixed B's and C's and Mostly C's	-0.113	0.074	0.893	
Mixed C's and D's or lower	-0.202	0.127	0.817	
Missing GPA/did not answer	0.019	0.168	1.019	
When compared to students whose income is not known because they did not receive aid:				
Low income (less than $30,621)	-0.106	0.145	0.899	
Lower-middle income (between $30,621-$52,719)	0.081	0.145	1.084	
Upper-middle income (between $52,719-$75,356)	0.050	0.147	1.051	
High income (more than $75,356)	0.342	0.157	1.408	*
When compared to being dependent on parents for support or indeterminate dependency status:				
Self-supporting	-0.317	0.152	0.728	*
When compared to students from schools in suburban areas or large or small towns:				
Urban locale	0.128	0.093	1.136	
Rural locale	0.061	0.079	1.063	
When compared to students from schools where more students qualify for free or reduced lunch:				
Fewer students on free/reduced lunch	0.085	0.083	1.089	

Continued on Page 44

Table 4.3, continued
Logistic regression analysis of variables associated with within-year persistence by freshman financial aid recipients enrolled in Indiana's public colleges in 1999-2000

Variables	Coefficient	Std. err.	Odds ratio	Sig
When compared to students from schools with high concentrations of minority students:				
Low minority concentration in high school	0.019	0.098	1.019	
When compared to students from schools with few Honors graduates:				
High percentage of Honors graduates in high school	0.044	0.075	1.045	
When compared to students who in ninth grade stated they aspired to a four-year degree or higher:				
Aspire to high school diploma	-0.139	0.143	0.871	
Aspire to less than a two-year degree	0.061	0.154	1.063	
Aspire to a two-year degree	-0.257	0.111	0.774	*
Aspiration is undecided or no response	-0.211	0.097	0.810	*
When compared to students who earned a B grade point average while in college:				
Below C or No grade point average	-1.422	0.069	0.241	***
C average	0.216	0.106	1.242	*
A average	0.772	0.150	2.164	***
When compared to students who live off campus or with parents while in college:				
On-campus living situation	0.439	0.070	1.551	***
When compared to students attending research universities:				
Two-year college	-0.195	0.125	0.823	
Other four-year	-0.154	0.094	0.857	
When compared to students who received financial aid but were not Scholars:				
Aid recipients who also got Twenty-first Century Scholarships	-0.019	0.113	0.981	

N of cases = 11,881 [1]
Model X^2 = 1018.981
-2 Log likelihood = 7507.901
Cox & Snell Pseudo R2 = 0.082

[1] The total number of observations was 12,888. However, 1,007 observations did not enter the regression because of missing values in one or more variables.

Appendix 5
Twenty-first Century Scholars GEAR UP Scholarship

A major thrust of the GEAR UP program is early intervention. Indiana is making great strides in preparing Twenty-first Century Scholars to succeed in college, but the academic needs of some students remain great. Because many Scholars have not been given appropriate curriculum, instruction or academic support to succeed in college, they might need to take basic preparatory courses before they begin courses to satisfy program and degree requirements.

If a Scholar takes preparatory or introductory college courses in the summer before enrolling in a regular program in the fall, he or she might need financial assistance to pay for summer school tuition and fees. Without this summer intervention, a Scholar who takes such courses in the fall semester might fall behind in major program requirements. The GEAR UP Scholarship pays for summer school.

In order to be considered for a GEAR UP Scholarship, a student must complete an application and be:

1) An affirmed Scholar admitted to an eligible Indiana college and otherwise eligible to receive the Twenty-first Century Scholarship.
2) A Scholar attending college for the first time. (That is, the Scholar must be considered a first-time freshman.)
3) In need of special academic assistance as determined by the college and evidenced by enrollment in an appropriate and organized program to provide that assistance.
4) Enrolled in either a summer school immediately before the first semester or immediately after the first year in college.
5) Recommended by the appropriate office of the college.

The GEAR UP Scholarship is a non-renewable grant of up to $2,500 that pays for summer school tuition and fees including a stipend of up to $300. The Scholarships are on a first-come basis. Once a Scholarship is approved and the State Student Assistance Commission billed, tuition will be paid directly to the college. Stipends will be paid directly to the school to be used as a credit by the Scholar for textbooks and other course-related supplies.

Source: This appendix was provided by the State Student Assistance Commission of Indiana

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Endnotes

1 As of 2001-02, applications can be made in the seventh or eighth grade.

2 If a Scholar chooses to attend a private or independent college in Indiana, the award will pay an amount equal to the average cost of full tuition at Indiana public colleges. At a proprietary school, the award will pay an amount up to the cost of full tuition at Ivy Tech State College. In 2001-02, the SSACI limit on the scholarship was $3,720. The cap for the total state award was $8,760.

3 Core 40 — a set of rigorous high school courses designed to improve academic preparation in Indiana high schools — was adopted in 1994 in a joint meeting by the Indiana State Board of Education and Indiana Commission for Higher Education. Although not a requirement for graduation, enrollment in Core 40 (or in courses that lead to Core 40 completion) is now the minimum expectation for students who plan to attend college. Indiana's public and independent four-year colleges and universities now require Core 40 for regular admission, and Core 40 is recommended for students seeking admission to Indiana's two-year public institutions.

4 Since the number of eligible students who did not enroll in college is not known for the 1995 cohort, the total number of participants is also not known. However, if 500 students were eligible and did not enroll in 1995 (a reasonable estimate, given the trends in Table 1), then about 15,000 have been served in the program.

5 In Indiana, about 5.8 percent of the 1999 cohort (Table 3.1) attended out of state in Fall 1999, and Scholars were more likely to go out of state (Table 3.2.D).

6 May 29, 2002, e-mail communication from Nick Vesper, State Student Assistance Commission of Indiana.

7 This analysis is limited to public colleges because of constraints in the data available through the Student Information System at the Indiana Commission for Higher Education.

8 In Indiana, school districts are called *school corporations*. Most school corporations include all schools in a county, including schools in different types of locales.

9 Thus, Higher Education Award (HEA) grants reward merit and are awarded based on need. This arrangement held together both Republican and Democratic support for the full

funding of grant programs and actually resulted in larger average awards than had been the case in the early 1990s (St. John, Hu, and Weber, 2001). However, this award strategy has a potentially regressive quality, in the sense that students who attend low-quality high schools could be disadvantaged financially when they enroll in college (St. John and Musoba, in press). As Table 7 (Page 14) indicates, students from urban corporations were less likely to have the opportunity to take the advanced courses needed for an Honors diploma.

10 The Indiana Commission for Higher Education has been funded by Lumina Foundation to assess the impact of high school curriculum on student achievement (i.e., SAT scores) and high school graduation rates.

11 The database did not include information on parents' income for students in the eighth grade. Scholars were low-income students who took the pledge. However, there were other low-income students in the sample because the database represented approximately 80 percent of Indiana ninth-graders.

12 Students with no evidence of enrollment were assigned to the reference group. For this study we had information on students who enrolled in state at public institutions. We had information on private college enrollment by students who received state grants. For other students, we had information on aid applications for private colleges in-state and out-of-state colleges. Most first-year students who apply to private and out-of-state colleges fill out the federal application because it is used for federal loans and most institutional aid programs. Therefore, most students who attended college would be represented in the non-reference groups. However, a very small number of college students are included in the reference group incorrectly (i.e., students who enrolled in private or out-of-state colleges but did not apply for student aid) and a very few students who did not go to college may have been counted as attending private colleges or out-of-state colleges. We expect that there were very few of these cases.

13 Appendix 2 (Page 30) describes the procedure used to develop the merged database from ICPAC surveys and other state data sources.

14 For private colleges, we had data to indicate when state grant recipients actually enrolled in state, but we estimate enrollment in private colleges in Indiana based on financial aid information for other students. These students may have applied for loans or merit aid. This is a limitation of the database, and correction was not possible.

15 We have the same quality of information on probable out-of-state enrollment for Scholars and non-Scholars. Given that students who apply out of state have a high probability of enrolling in college (Hossler, Schmit, and Vesper, 1999), we expect this analysis provides a reasonable estimate of the impact of the Scholars Program on enrollment out of state.

16 Variables in Tables 3.2A, B, C and D with odds ratios of less than 1.0 indicate a reduction in the odds of enrolling.

17 Our supplemental analyses reveal that students who received Scholars aid did not differ in their persistence from students who did not receive this additional award (see Table 4.3, Pages 43 and 44). Supplemental analyses of low-income aid recipients did not indicate a significant difference for Scholars. Additional analysis is needed to untangle these effects further.

18 Simple comparative statistics of this type do not indicate that a variable influences an outcome, even when there is statistical significance.

19 Aid packages are awarded based on financial need. Students receiving aid, including low-income students, are more likely to persist

because of these aid packages. This represents a substantial improvement over the national trend, which reveals a growing gap in the opportunity to persist for low-income students compared to high-income students (Advisory Committee on Student Financial Assistance, 2002).

20 Some reviewers have concluded that there is no value added by the additional Scholars award because the two types of aid packages have similar effects. We cannot fully resolve this question at present.

21 The additional aid over the state grant functions as merit. Students earning this award had to fulfill their "contract" with the state to earn this additional award. This definition of merit is appropriate given that about half of the low-income population does not prepare for college (Advisory Committee on Student Financial Assistance, 2002; NCES, 1997).

22 Lumina Foundation for Education has agreed to fund a study by the Indiana Commission for Higher Education and the Indiana Education Policy Center to examine these linkages.

23 The reader is reminded that many of the students who receive other types of aid packages actually are awarded merit aid. Therefore, analyses of the effects of both types of aid packages actually included the effects of merit and need-based aid. This analysis indicates that the Twenty-first Century Scholars Program has similar effects as other aid (i.e., inclusive of need-based and merit grants along with loans).

24 There was also evidence from the more detailed analyses that attending high schools with high percentages of Honors graduates had a confounding relationship with enrollment in four-year colleges by African-American students.

25 It is possible to construct a statistical model that would assess the effects of high school curriculum (i.e., percentages of students completing Core 40 and Honors) on advanced placement pass rates, controlling for school corporation characteristics (i.e., locale, poverty and diversity). Such an analysis would be needed to confirm this linkage.

26 This conclusion is based on data provided by the College Board at: *http://www.collegeboard.com/sat/cbsenior/yr2001/2001reports.html*. Powell and Steelman (1996) found "80 percent of this variation (between states) in SAT scores could be attributed to the percentage of students taking the SAT test" (p. 27).

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